REMARKS

This Amendment is submitted in response to the outstanding Office Action dated April 19, 2004 wherein the Examiner rejected claims 1-3,6-10, 13-18, 21 and 22 and objected to claims 5, 12 and 20 as being dependent upon a rejected base claim. Reconsideration of the rejections in view of the following remarks is respectfully requested.

The rejection under 35 USC Section 103

The Examiner rejected claims 1-3, 6-10, 13-18 and 21-22 as being unpatentable over Klein in view of Sha et al. The Examiner stated that Klein teaches the invention as claimed, including a method for sharing execution capacity among tasks executing in a real time computing system having a performance specification in accordance with Rate Monotonic Analysis [RMA], comprising the steps of: pairing a higher priority task with a lower priority task (§4-55); **reallocating execution time from the lower priority task to the higher priority task during a busy period (§4-55,58);** increasing the period of the lower priority task to compensate for said reallocated execution time (§4-59; step 6); and limiting an amount of execution time, $N_r$, to borrow from said lower priority task, $task_r$, to a maximum loan amount where $N_R << C_r$ (§4-56, 57;

steps 3-6), where $C_x$ = worst-case task execution time of task $_x$ (§4-56, 57; steps 1-6). The Examiner further stated Sha teaches the invention as claimed, including that the reallocation of execution time occurs during an overload condition (§4.2, pgs. 258-259. Applicants respectfully traverse this rejection on the grounds that the cited portions of Klein or Sha do not teach or suggest **reallocating by borrowing execution time from the lower priority task and reallocating it to the higher priority task during a busy period**, as claimed by Applicant in the amended claims.

Section 4-55, 58 of Klein teaches calculating "the amount of execution time that can be added to the response to an event sequence *ex* while preserving the schedulability of a specified lower priority event sequence, *ei*." Klein further states "[f] or this technique we have two event sequences, ex and ei. We want to **add extra execution time to ex** while maintaining the guarantee that ei will finish no later than its deadline. This technique is used to find out how much spare capacity exists for an event sequence". Spare capacity is the amount of execution time that can be added to the response to the event while preserving the schedulability of lower priority event sequences." Klein does not teach or suggest reallocating by borrowing execution time from the lower priority task and reallocating it to the higher priority

task during an overload condition as claimed by Applicant. Klein teaches just adding extra time to ex while maintaining the guarantee that ei will finish no later than its deadline. Applicants specification states that during an overload condition, the higher priority task can borrow execution time from the execution capacity of the lower priority task without affecting the schedulability of the rest of the system. Applicants have amended the claims so that the reallocating is made perhaps clearer by stating that it means borrowing from the lower priority task and reallocating to the higher priority task, although the specification is pretty clear on what this step means (see spec. page 4, lines 4-8). There is no teaching of this borrowing in Klein, but only of adding time while making sure that event sequence ei will finish no later than its deadline.

As explained in a previous amendment, Sha does not make up for this deficiency. The cited portions of Sha teach that "there exists a set of critical tasks such that all tasks in the set will meet their deadlines even if the processor is overloaded. This means that under worst-case conditions, tasks outside the critical set may miss their deadlines...This means that if a transient overload should develop, tasks with longer periods will miss their deadlines." Sha does teach period transformation but this does not teach borrowing but rather splitting up a high priority task

over several short periods. The problem is when you are working in a real time dynamic situation you do not necessarily know what the period T is. If you do not know the period T, then you can't split it up. Accordingly, Sha's period transformation would not work in a system where you do not necessarily know the period T. Applicants do not see where in Sha it teaches reallocating by borrowing execution time from the lower priority task and reallocating it to the higher priority task during an overload condition as claimed by Applicant. Accordingly, Applicant respectfully submits that these claims are allowable over the references of record.

Claims 5, 12 and 20 are allowable for being dependent upon the above independent claims, and therefore include all the patentability distinct features and are allowable for the reasons stated above. Accordingly, Applicant respectfully submits that the claims are allowable over the references of record for the reasons stated above. Entry of this Amendment reconsideration of the rejections and allowance of all the claims is respectfully requested.

Respectfully submitted,

By _____
Laurie E. Gathman, Reg. 37,520
Attorney
(914) 333-9605

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